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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b).)

Attorney Docket No. Mo-5586/LeA 33,605
 First Inventor or Application Identifier Hans-Ulrich Buschhaus
 Title WATER-BASED FORMULATIONS WITH FUNGI ...
 Express Mail Label No. EK243942466US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: Assistant Commissioner for Patents
 Box Patent Application
 Washington, DC 20231

1. ☒ * Fee Transmittal Form (e.g., PTO/SB/17)
 (Submit an original and a duplicate for fee processing)
2. ☒ Specification [Total Pages 7]
 (preferred arrangement set forth below)
 - Descriptive title of the invention
 - Cross References to Related Applications
 - Statement Regarding Fed sponsored R & D
 - Reference to Microfiche Appendix
 - Background of the invention
 - Brief Summary of the invention
 - Brief Description of the Drawings (if filed)
 - Detailed Description
 - Claim(s)
 - Abstract of the Disclosure
3. ☐ Drawing(s) (35 U.S.C. 113) [Total Sheets ☐
4. Oath or Declaration [Total Pages 2]
 a. ☒ Newly executed (original or copy)
 b. ☐ Copy from a prior application (37 C.F.R. § 1.63(d))
 (for continuation/divisional with Box 16 completed)
 i. ☐ DELETION OF INVENTOR(S)
 Signed statement attached deleting
 inventor(s) named in the prior application,
 see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

5. ☐ Microfiche Computer Program (Appendix)
6. Nucleotide and/or Amino Acid Sequence Submission
 (if applicable, all necessary)
 a. ☐ Computer Readable Copy
 b. ☐ Paper Copy (identical to computer copy)
 c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. ☒ Assignment Papers (cover sheet & document(s))
8. ☐ 37 C.F.R. § 3.73(b) Statement of Power of Attorney
 (when there is an assignee)
9. ☐ English Translation Document (if applicable)
10. ☐ Information Disclosure Statement (IDS) PTO-1449
☐ Copies of IDS Citations
11. ☒ Preliminary Amendment
12. ☒ Return Receipt Postcard (MPEP 503)
 (Should be specifically itemized)
13. ☐ Small Entity Statement(s) filed in prior application.
 Status still proper and desired
 (PTO/SB/09-12)
14. ☒ Certified Copy of Priority Document(s)
 (if foreign priority is claimed)
15. ☐ Other: _____

* NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY
 FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT
 IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No. _____
 Prior application information: Examiner _____ Group / Art Unit _____

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

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10675 U.S. PTO

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PATENT APPLICATION
Mo-5586
LeA 33,605

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION OF)
HANS-ULRICH BUSCHHAUS ET AL)
SERIAL NUMBER: TO BE ASSIGNED)
FILED: HEREWITH)
TITLE: WATER-BASED FORMULATIONS)
WITH FUNGICIDAL ACTION)

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231
Sir:

Prior to examination, please amend the application as follows.

IN THE CLAIMS:

Page 5, line 1: Change "**Patent Claims**" to --WHAT IS CLAIMED IS:--.

Cancel Claims 1-10 and add Claims 11-20.

--11. An aqueous system comprising at least one hydrolysis-sensitive fungicidal, bactericidal, and/or insecticidal active compound in combination with one or more binders consisting of an alkyd resin based on vegetable oils and/or acrylate dispersions and having a pH \leq 7.

12. An aqueous system according to Claim 11 wherein the binder has a pH \leq 5.

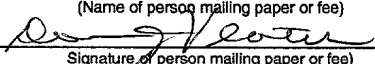
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13. An aqueous system according to Claim 11 wherein the binder has a $\text{pH} \leq 3$.

14. An aqueous system according to Claim 11 wherein the active compound has a functional group $\text{N-S-CCl}_2\text{X}$ wherein X represents halogen, $\text{C}_1\text{-C}_4$ alkyl, or halogen-substituted $\text{C}_1\text{-C}_4$ alkyl.

15. An aqueous system according to Claim 11 wherein the active compound is folpet, captan, captafol, dichlofluanid, tolylfluanid, fluorfolpet, or a mixture thereof.

16. A method for stabilizing hydrolysis-sensitive fungicidal, bactericidal, and/or insecticidal active compound in an aqueous system comprising incorporating into the aqueous systems one or more binders consisting of an alkyd resin based on vegetable oils and/or acrylate dispersions and having a $\text{pH} \leq 7$.

17. A method according to Claim 16 wherein the binder has a $\text{pH} \leq 5$.

18. A method for protecting aqueous systems against microbial infestation comprising incorporating into the aqueous system at least one hydrolysis-sensitive fungicidal, bactericidal, and/or insecticidal active compound in combination with one or more binders consisting of an alkyd resin based on vegetable oils and/or acrylate dispersions and having a $\text{pH} \leq 7$.

19. A method according to Claim 18 wherein the binder has a $\text{pH} \leq 5$.

20. A binder comprising an alkyd resin based on vegetable oils and/or acrylate dispersions and having a $\text{pH} \leq 7$ in combination with a hydrolysis-sensitive fungicidal, bactericidal, and/or insecticidal active compound.--

IN THE SPECIFICATION:

Page 1, line 1: Change "**Water-based formulations with fungicidal action**" to --**WATER-BASED FORMULATIONS WITH FUNGICIDAL ACTION**--.

Page 4, line 11: In the fourth column of the table, change the heading from "pH of B" to --pH of Binder--.

IN THE ABSTRACT:

Amend the Abstract at page 7 to read as follows:

-- WATER-BASED FORMULATIONS WITH FUNGICIDAL ACTION
ABSTRACT OF THE DISCLOSURE

The invention relates to storage-stable aqueous formulations containing at least one hydrolysis-sensitive active compound in combination with binders consisting of an alkyd resin based on vegetable oils and/or acrylate dispersions and having a pH \leq 7.--

REMARKS

Applicants hereby offer preliminary amendments to the present application to place the application in better form for allowance.

Applicants have canceled Claim 1 in favor of Claim 11 to correct informalities and to indicate more clearly that the term "active compound" refers to biologically active compounds. Claim 11 is fully supported in the specification, for example, at page 1, lines 25-31. Dependent Claims 12-15 correspond to canceled Claims 2-5 and thus remain fully supported in the specification. Applicants have canceled Claims 6-8 in favor of Claims 16-19 to replace "use" claims with corresponding method claims and to avoid the multiple dependency of canceled Claim 8. (Applicants note in this respect the subject matter of Claim 16 corresponds to canceled Claim 10.) Canceled Claims 16-19 are thus fully supported in the specification. Applicants have canceled Claim 9 in favor of Claim 20. Claim 20 is supported in the specification for the reasons discussed with respect to Claim 11.

Applicants have amended the specification to indicate more clearly in the table at page 4 that the pH values listed in column 4 refer to the binder. Applicants have also amended the specification to capitalize all letters in the title. Applicants have similarly amended the title of the Abstract and have made other changes to the Abstract so that it conforms more clearly to the claims. A copy of the amended Abstract is separately attached.

In view of the preceding amendments and remarks, allowance of the claims is respectfully requested.

Respectfully submitted,

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THOMAS JAETSCH
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WATER-BASED FORMULATIONS WITH FUNGICIDAL ACTION

ABSTRACT OF THE DISCLOSURE

The invention relates to storage-stable aqueous formulations containing at least one hydrolysis-sensitive active compound in combination with binders consisting of an alkyd resin based on vegetable oils and/or acrylate dispersions and having a pH \leq 7.

Water-based formulations with fungicidal action

5 The present specification relates to storage-stable aqueous formulations which in addition to hydrolysis-sensitive active compounds comprise special binders for stabilizing the active compounds.

Their sensitivity to hydrolysis imposes conditions on the suitability of many broad-spectrum fungicides for use in water-based systems.

10 The mode of action of, for example, trihalogenomethylthio compounds such as dichlofluanid, tolylfluanid, fluorfolpet and folpet is based on the ability of the N-S bond to open in order subsequently to react nucleophilic groups (e.g. SH groups).

15 The half-life of the majority of these compounds in aqueous systems is a few minutes at alkaline pH levels (about pH 9), in the neutral range (about pH 7) a few hours, and in the acidic range (about pH 4) a few days.

20 Their use in water-based, so-called ready-to-use wood preservation varnishes and primers, emulsion paints and antifouling paints is therefore not an option owing to the short shelf life, which derives from the instability of the fungicides.

Surprisingly and totally unexpectedly it has now been found that active compounds sensitive to hydrolysis can be stabilized by using specific binder systems.

25 The specification therefore provides aqueous systems comprising at least one hydrolysis-sensitive active compound in combination with binders which consist of alkyd resins based on vegetable oils and/or acrylate dispersions and which in aqueous systems have a pH ≤ 7 .


30 Active compounds sensitive to hydrolysis are, in particular, fungicides, bactericides and insecticides which in acidic, neutral and especially alkaline systems have a half-life of a few minutes to six months.

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Such active compounds are, in particular, compounds containing a functional group -N-S-CCl₂X, where X preferably represents fluorine, chlorine or CHCl₂.

5 Hydrolysis-sensitive active compounds for the purposes of the invention are, in particular, folpet, captan and captafol and, preferably, dichlofluanid, tolylfluanid and fluorfolpet.

10 Binders for the purposes of the invention are alkyd resins and acrylate dispersions, which may also, optionally, be present in copolymeric form and which have the characteristic that in aqueous solutions or emulsions they have a pH ≤ 7 , in particular ≤ 5 , preferably ≤ 3 .

15 Examples of preferred binders which may be mentioned are as follows: alkyd/maleic anhydride copolymers, alkyd/modified linseed oil, alkyd resins, alkyd resin/soya oil/linseed oil in combination with acrylate dispersion.

Both the active compounds and the binders are known and are commercially available.

20 The aqueous systems of the invention, or ready-to-use compositions, contain preferably from 0.001 to 90, in particular from 0.01 to 50, more preferably from 0.1 to 5, with particular preference from 0.1 to 2 per cent by weight of active compound and preferably from 3 to 80, in particular from 5 to 50 and, more preferably, from 5
25 to 30 per cent by weight of binder.

Preferred examples of aqueous systems are water-based paints such as, in particular, emulsion paints and antifouling paints and also, preferably, wood preservatives such as, in particular, wood preservative varnishes and primers.

30

5 Aqueous systems optionally include constituents which are common for – in particular – wood preservative varnishes, emulsion paints and antifouling paints, such as pigments, dyes, auxiliaries, binders, emulsifiers, dispersants and further active compounds such as fungicides, insecticides and/or bactericides not sensitive to hydrolysis.

10 The aqueous systems of the invention have the advantage over the known systems that the active compounds are stable for long periods against hydrolysis and decomposition, both in an acidic and in a neutral medium.

The invention is elucidated further by the following examples. The invention is not restricted to the examples. In the text below, percentages are by weight.

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Example

5 Tolyfluanid (TF) is incorporated into various water-based wood preservatives with stirring. The samples are tested for their storage stability at room temperature. The amount of active compound in the samples is measured by means of HPLC.

The table below reports the results:

Table 1

10

Ex.- No	%	Binder Description	pH of B	% TF		% TF, storage at RT				
				theor.	after prep.	1 mth.	2 mth.	3 mth.	9 mth.	12 mth.
1	16.5	Alkyd/soya/linseed oil + acrylate dispersion	2	0.74	0.72	0.80	0.69	0.69	0.67	0.69
2	16.5	Alkyd	3.5-5	0.74	0.74	0.97	0.75	0.64	0.63	0.62

Patent claims

1. Aqueous systems comprising at least one hydrolysis-sensitive active compound in combination with binders which consist of alkyd resin based on vegetable oils and/or acrylate dispersions and have a pH ≤ 7 .
5
2. Aqueous systems according to Claim 1, in which the binders have a pH ≤ 5 .
3. Aqueous systems according to Claim 1, in which the binders have a pH ≤ 3 .
10
4. Aqueous systems according to Claim 1 which comprise as active compound compounds having a functional group N-S-CCl₂X, where X represents halogen or optionally halogen-substituted C₁-C₄-alkyl.
5. Aqueous systems according to Claim 1, which comprise as active compounds folpet, captan, captafol, dichlofluanid, tolylfluanid and/or fluorfolpet.
15
6. Use of binders which consist of alkyd resin based on vegetable oils and/or acrylate dispersions and have a pH ≤ 7 in water for stabilizing hydrolysis-sensitive active compounds in aqueous systems.
20
7. Use of binders which consist of alkyd resin based on vegetable oils and/or acrylate dispersions and have a pH ≤ 7 in water in combination with hydrolysis-sensitive active compounds for protecting aqueous systems against microbial infestation.
25
8. Use according to one of Claims 6 and 7, characterized in that the aqueous systems have a pH ≤ 5 .

9. Binders comprising alkyd resin based on vegetable oils and/or acrylate dispersions having a pH ≤ 7 in water in combination with hydrolysis-sensitive active compounds.
10. Method of stabilizing hydrolysis-sensitive active compounds in aqueous systems, characterized in that the aqueous systems are admixed with binders consisting of alkyd resin based on vegetable oils and/or acrylate dispersions and having a pH < 7 in water.

Water-based formulations with fungicidal action

Abstract

The present specification relates to storage-stable aqueous formulations which in addition to hydrolysis-sensitive active compounds comprise special binders for stabilizing the active compounds.

COMBINED DECLARATION AND POWER OF ATTORNEY

ATTORNEY DOCKET NO

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Water-based formulations with fungicidal action

the specification of which is attached hereto,

or was filed on _____ as

Application Serial No. _____

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

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Prior Foreign Application(s), the priority(ies) of which is/are to be claimed:

19918730.4
(Number)

Germany
(Country)

April 24, 1999
(Month/Day/Year Filed)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose the material information as defined in Title 37, Code of Federal Regulations, §1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

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(patented, pending, abandoned)

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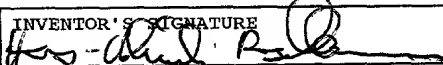
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POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

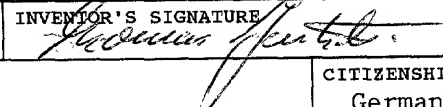
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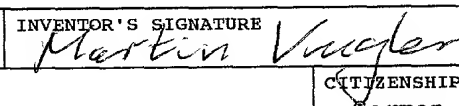
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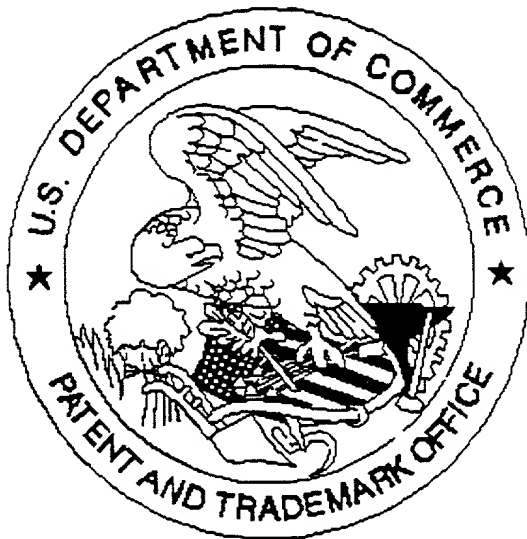
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